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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,386	07/23/2003	Sundeep Chauhan	STL10986	2363

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David K. Lucente
Seagate Technology LLC
Intellectual Property - COL2LGL
389 Disc Drive
Longmont, CO 80503

EXAMINER	
NGUYEN, HAI L	

ART UNIT	PAPER NUMBER
2816	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/625,386	CHAUHAN, SUNDEEP	
	Examiner	Art Unit	
	Hai L. Nguyen	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7-12,16-22,25 and 26* is/are rejected.

7)☒ Claim(s) *4-6,13-15,23 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Argument

1. The response letter received on 5/16/2005 has been reviewed and considered with the following results:

After reviewing the amendment and reconsideration, the amendment filed on 02/15/2005 has been entered; and the Advisory Action has been withdrawn.

As to the objections to the specification, Applicant's clarifications have overcome the objections, as such; the objections have been withdrawn.

As to the rejection to the claims, under 35 U.S.C. 112, 1st & 2nd paragraphs, Applicant's clarifications have overcome the rejections, as such; the rejections have been withdrawn.

The prior art rejections to the claims made in the previous Office Action are now withdrawn in view of Applicant's arguments, the arguments have been considered but are moot in view of a new action on the merits appears below.

Claim Objections

2. Claim 2 is objected to because of the following informalities: "a numerical phase difference value" in the last 2 lines should be changed to --the numerical phase difference value-- and the claimed limitation "wherein the encoding circuitry converts the values stored in the parallel latch into a numerical phase difference value" is redundant to the claimed limitation in claim 7. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 8, and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are the elements of the invention that are necessary to perform the recited function such as "generates a phase error responsive to a transition location signal". Furthermore, "A phase/frequency comparator that generates a phase error responsive to a transition location signal", in claim 1, is simply a preamble, and there is no means in claim 1 to perform the recited function. See MPEP § 2111.02, 2111.03, and 2114.

Claims 8 and 9 are rejected due to their dependencies on claim 1.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 7, 10-12, 16, 17, 20-22, 25, 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Staszewski et al. (US Pat. 6,429,693; previously cited).

With regard to claim 1, Staszewski et al. discloses in Figs. 1-8 a phase/frequency comparator (804) that inherently generates a phase error responsive to a transition location signal. Even though, Staszewski et al. does not label that circuit as a phase/frequency comparator. One of ordinary skill in the art would infer that circuit as a phase/frequency comparator. Furthermore, the limitation "generates a phase error responsive to a transition location signal" is purely a result function of the phase/frequency comparator and thus has not been given patentable weight, and any phase/frequency comparator inherently has that result function as well. Therefore, the reference also meets that recited limitation.

With regard to claim 7, the phase/frequency comparator further comprises a phase detecting stage that generates a result (Q(0)-Q(L-1)) that represents an instantaneous phase difference; and encoding circuitry (NORM) coupled to the phase detecting stage; wherein the encoding circuitry converts a result of the phase detecting stage into a numerical phase difference value (PHF).

With regard to claim 2, the phase detecting stage further comprises a tapped delay line (502s) having a plurality of outputs and configured to receive a first signal (CKV); and a parallel latch coupled to the plurality of outputs of the tapped delay line and configured to receive a second signal (110), wherein the parallel latch stores the values of the plurality of outputs of the tapped delay line in response to a transition in the second signal; and wherein the encoding circuitry converts the values stored in the parallel latch into a numerical phase difference value.

With regard to claim 3, the phase/frequency comparator further comprises an accumulator (102) coupled to the encoding circuitry, wherein the accumulator adds the numerical phase difference value to a value stored in the accumulator to obtain an accumulated phase error (PHE).

With regard to claim 10, Staszewski et al. discloses in Figs. 1-8 a phase locked loop comprising a controllable oscillator (103); and a phase/frequency comparator includes a phase detecting stage (201); encoding circuitry (NORM) coupled to the phase detecting stage; and an accumulator (102) coupled to the encoding circuitry.

With regard to claim 11, the phase detecting stage further comprises a tapped delay line (502s) having a plurality of outputs and configured to receive a first signal (CKV); and a parallel latch coupled to the plurality of outputs of the tapped delay line and configured to receive a second signal (110), wherein the parallel latch stores the values of the plurality of outputs of the tapped delay line in response to a transition in the second signal; and wherein the encoding circuitry converts the values stored in the parallel latch into a numerical phase difference value (PHF).

Claim 12 is similarly rejected; note the above discussion with regard to claim 3.

With regard to claim 16, the forward path includes additional control circuitry (105).

With regard to claim 17, the reference also meets the recited limitation in the claim.

With regard to claim 20, Staszewski et al. discloses in Figs. 1-8 a corresponding method comprising the steps of generating a snapshot ($Q_{(0)}$-$Q_{(L-1)}$) of a first signal (114) in response to receiving a second signal (110); and mapping the snapshot to a numerical phase difference value

(PHF) that is generated responsive to a signal that corresponds to a transition location of the first signal (TDC_RISE, TDC_FALL).

With regard to claim 21, the method further comprises the steps of combining the numerical phase difference value (PHF) with a value in an accumulator (102) to obtain a new accumulator value; and presenting the new accumulator value (PHE) as a result of a phase comparison.

With regard to claim 22, the method further comprises the steps of propagating the first signal (114) through a tapped delay line (502s); latching outputs of the tapped delay line in a parallel latch (504s) in response to a transition in the second signal (110) to obtain the snapshot of the fist signal.

With regard to claims 25 and 26, controlling an output frequency (RF OUT) of an oscillator (103) using the result of the phase comparison, wherein the first signal (CKV) is an output of the oscillator (RF OUT through 106).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staszewski et al. in view of Brachmann et al. (US 6,351,154; previously cited).

With regard to claim 8, the above discussed the apparatus of Staszewski et al. meets all of the claimed limitations except that Staszewski et al. does not disclose the apparatus is implemented on a single monolithic integrated circuit. Brachmann et al. teaches in Fig.5 a similar apparatus can be implemented as integrated circuit (column 4, lines 20-33) as recited in the claim. Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to implement that teaching with the apparatus of Brachmann et al. for the advantage of reducing additional cost when implemented within other circuits, e.g. ASIC, PLD, FPGA, PLL etc.

Claim 18 is rejected for similar motivation; note the above discussion with regard to claim 8.

9. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staszewski et al.

With regard to claims 9 and 19, the above discussed circuit of Staszewski et al. meets all of the claimed limitations except for the intended use as implemented in a field programmable gate array. However, it is noted that the reference circuit has the ability to be used in this environment as well. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to implement that circuit taught by Staszewski et al. in the field programmable gate array for the advantage of saving power consumption from the circuit.

Allowable Subject Matter

10. Claims 4-6 and 13-15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. Claims 23-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to disclose or fairly suggest a phase/frequency comparator (as shown in Fig. 3), as recited in claims 4 and 13, having specific structural limitations such as an encoding circuitry includes an edge detector (304) coupled to the parallel latch (302); and a weighted encoder (306), wherein the edge detector outputs a transition location signal that indicates a location of a transition in the values (500 in instant Fig. 5) stored in the parallel latch; and wherein the weighted encoder outputs a weighted numerical value (516) that corresponds to the transition location signal, and being configured in combination with the rest of the limitations of the base claims and any intervening claims.

The prior art of record does not disclose or suggest a method of use thereof, as recited in claim 23, comprising the step of detecting (300, 302, 304 in instant Fig. 3) a location of an edge in the snapshot of the first signal (output signals of 304); and mapping (306) the location into a weighted numerical value, and being configured in combination with the rest of the limitations of the base claims and any intervening claims.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai L. Nguyen whose telephone number is 571-272-1747 and Right Fax number is 571-273-1747. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The official fax phone number for the organization where this application or proceeding is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HLN
July 12, 2005

TIMOTHY P. CALLAHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800